

REMARKS

This amendment and response are submitted in reply to the Office Action dated July 31, 2008, in which the Examiner:

rejected claims 1 and 9 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement;

rejected claims 1-4, 6-9 and 13-43 under 35 U.S.C. § 112, second paragraph, as indefinite;

rejected claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent Application Publication No. 2004/0011484 to Saviharju et al. in view of WIPO Publication WO 93/11297 to Kuusio et al. and U.S. Patent No. 5,226,927 to Rundstrom and further in view of U.S. Patent No. 3,607,117 to Shaw et al. and U.S. Patent No. 4,312,702 to Tomlinson II;

rejected claims 6-8, 14-15, 19-31 and 41 under 35 U.S.C § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom, and further in view of Shaw and Tomlinson II and even further in view of U.S. Patent No. 4,627,173 to O'Hagan et al.;

rejected claims 16 and 37 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of RU-2011940 to Labedev-Krassin or U.S. Patent No. 4,644,136 to Watchman; and

rejected claim 43 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw, Tomlinson II and O'Hagan and even further in view of Labedev-Krassin or Watchman.

Applicants respectfully traverse these rejections below. Claims 1-4, 6-9 and 13-43 are currently pending. Claims 1, 9 and 19 are independent claims.

Claims 1, 9, 33 and 34 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. Specifically, claims 1 and 9 were rejected due on the recitation that "at least

part” of the bark is gasified. In the Office Action, the Examiner asserts that the Specification states that the bark is gasified, but does not recite that only part of the bark is gasified. (Office Action, page 5). Applicants respectfully disagree. Referring to Figure 2 of the present invention and the corresponding disclosure, the bark can be dried in one or more steps, shown as steps 11 and 13. (Specification, paragraph [0064]). After the drying, the bark is gasified in step 14. (Specification, paragraph [0066]). However, the present invention additionally discloses that material obtained after the first drying step (step 11) can be collected in silo 23, from which it may be sold outside of the mill. (Specification, paragraph [0070]). Material obtained from step 11 is dried bark that has not been gasified. This is clearly shown in Figure 2, where the transfer of material between drying step 11 and silo 23 does not include gasification step 14. (See Figure 2). Thus, Applicants clearly contemplated that the present invention does not require gasifying all of the bark. Accordingly, Applicants respectfully submit that this rejection is improper.

Claims 1 and 9 were also rejected as failing to comply with the written description requirement based on the recitation that “essentially the entire bark amount” is dried. The Examiner asserts that the term “essentially” was not defined in the Specification and is not embodied in the original disclosure because it implies that less than all of the bark can be dried. (Office Action, page 5). While it is true that claims 1 and 9 are directed to processes that enable all of the bark produced at a mill to be exploited in energy production, one of ordinary skill in the art should understand that, in application, it is very difficult to ensure that none of the bark produced in the debarking process is lost prior to the drying process. Accordingly, Applicants agree that the recitation “essentially the entire bark amount” should encompass a small range below the entire bark quantity. In particular, such a range should be great enough to account for bark lost in the debarking process, for example bark that is dropped during transport to the bark dryer. However, based on the known definition of “essentially,” one of ordinary skill in the art would still understand “essentially the entire bark amount” to mean that, in essence,

all of the bark is dried, allowing for normal bark losses during processing. Accordingly, Applicants respectfully submit that this rejection is improper.

Regarding the rejection of claim 33 as failing to comply with the written description requirement, the Examiner asserts that the recitation that the exit fuel gases from the drying of the bark are combined with the flue gases from the soda recovery boiler is not supported by the Specification. (Office Action, page 5). Applicants respectfully submit that amended claim 33 is fully supported by paragraph [0050] of the Specification. Accordingly, Applicants respectfully request that the rejection of claim 33 be withdrawn.

Claim 34 was rejected as failing to comply with the written description requirement based on the recitation that “essentially the entire bark amount” is gasified. The Examiner asserts that the term “essentially” embodied in the original disclosure because it implies that less than all of the bark can be gasified. (Office Action, page 5). Applicants respectfully submit that the rejection of claim 34 is improper for at least the reasons discussed above in connection claims 1 and 9.

Accordingly, Applicants respectfully submit that the rejection of claims 1, 9, 33 and 34 under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement is improper and should be withdrawn.

Claims 1-4, 6-9 and 13-43 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Regarding claims 1, 9 and 34, the Examiner asserts that the term “essentially” is subjective, and therefore, the limits are indefinite. (Office Action, page 6). As discussed above, Applicants respectfully submit that based on the known definition of “essentially,” one of ordinary skill in the art would understand “essentially the entire bark amount” to mean that, in essence, all of the bark is dried / gasified. Thus, one of ordinary skill in the art should understand that the term “essentially” encompasses a small range below the entire bark quantity to account for the practicality that it is very difficult to ensure that no bark from the mill is lost in the debarking process, prior to the drying process, for example bark that is dropped during transport to the bark dryer. Accordingly, Applicants respectfully request that this rejection be withdrawn.

Regarding the rejection of claims 1, 9 and 19, the Examiner asserts that the term “substantially” is subjective, and therefore, the limits are indefinite. (Office Action, page 6). Applicants respectfully submit that from the known definition of “substantially,” one of ordinary skill in the art would understand that the term “substantially” is used only to include a small range around exact continuity. In particular, the term “substantially” includes a small range around exact continuity to account for minor operating differences, for example if the fuel gas is momentarily delayed at the start of the burning of the concentrated liquor. However, one of ordinary skill in the art would not consider gas fed only during startup or intermittently to be fed “substantially continuously during the time in which the concentrated liquor is burned.” Accordingly, Applicants respectfully submit that this rejection is improper and should be withdrawn.

Applicants respectfully submit that the current amendment fully addresses the remainder of the indefiniteness rejections of claims 1-4, 6-9 and 13-43. Accordingly, Applicants respectfully request that the rejection of claims 1-4, 6-9 and 13-43 under 35 U.S.C. § 112, second paragraph, as indefinite be withdrawn.

Claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 were rejected under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II. A rejection under § 103 is improper unless the Examiner established a *prima facie* case of obviousness. A *prima facie* case of obviousness is not established unless the prior art references, alone or in combination, teach or suggest each and every claim recitation.

Applicants’ amended claim 1 recites a process for production of energy in a pulp mill comprising the steps of concentrating a waste liquor of a cellulose pulp digestion liquor, burning the concentrated liquor in a soda recovery boiler in the presence of biogenic fuels, and recovering thermal energy of flue gases obtained from the burning, wherein at least part of the biogenic fuel is a fuel gas from bark which is produced in the pulp mill in a debarking process, and wherein essentially the entire bark amount produced

in said debarking process is dried to a moisture content below 30% using waste heat of the pulp mill, whereafter at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler.

Applicants' amended claim 9 recites a process for producing energy in a sulfate pulp mill, the process comprising digesting, at least in part, wood material used for pulp production in cooking liquor to separate fibers from each other, extracting the digested wood material as black liquor from the separated fibers, concentrating the black liquor by evaporation, and burning the concentrated liquor in a soda recovery boiler with fuel gas produced from bark to regenerate cooking chemicals and to produce heat and electricity, wherein bark is produced in a debarking process in the sulfate pulp mill, essentially the entire bark amount is dried using waste heat of the pulp mill and at least part of the bark is brought into a gaseous form, formed ash is separated, a significant proportion of the fuel gas resulting from bringing the bark into gaseous form is burned in the same boiler as the concentrated liquor, the boiler being equipped with heat recovery for recovering heat from flue gas formed in the boiler, and the fuel gas is burned substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler.

Neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II, nor any combination thereof, teaches or suggests each and every recitation of Applicants' amended claims 1 and 9. Specifically, the combination fails to teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler.

Instead, Saviharju teaches that "[d]ried wood fuel, such as bark, is supplied through a line 12 to the gasification stage 10," and that "gas generated in the gasifier flow through a line 44 to the superheating boiler." (Saviharju, paragraph [0021]). In fact, the Examiner asserts in the Office Action that Saviharju does not teach that the gas obtained from the bark is

burned in the recovery boiler. (Office Action, page 12). By feeding the fuel gas into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned, the processes recited in amended claims 1 and 9 improve energy efficiency and simplify the pulp mill apparatus by eliminating the need for a separate bark boiler. Saviharju, which teaches the use of a separate superheating boiler to increase power yield at a pulp mill without corrosion problems (Saviharju, paragraph [0007]-[0009]), does not teach or suggest the elimination of a separate bark boiler.

Kuusio does not overcome the deficiencies of Saviharju at least in that Kuusio also does not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead Kuusio teaches “that the same fuel which is combusted in the recovery boiler, e.g. black liquor, may be processed by gasifying to provide the fuel for the separate superheating boiler.” (Kuusio, page 6, lines 17-21). The gasification of waste *liquor* does not teach or suggest the gasified bark of Applicants’ amended claims 1 and 9. In fact, Kuusio states that one advantage of gasifying waste liquor for the superheating boiler is that “substantially no auxiliary fuel, such as ... wood waste, is needed for the separate superheating unless it is desirable...” (Kuusio, page 6, lines 22-24, emphasis added). Thus, Kuusio is directed at eliminating the use of wood waste, such as bark, as a fuel. Furthermore, even when using wood waste as a fuel, Kuusio does not teach or suggest first gasifying the wood waste, and certainly does not teach supplying the wood waste to the soda recovery boiler. While Kuusio does teach that the waste liquor gas can be used as a *starting* fuel in the waste liquor recovery boiler (Kuusio, p. 10, line 37 – p. 11, line 1; emphasis added), use of the gasified waste liquor in a recovery boiler does not teach or suggest anything about the burning of gasified bark in the recovery boiler. Furthermore, Kuusio’s use of the gasified waste liquor as a *starting* fuel does not teach or suggest that fuel gas is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned. The Examiner asserts that “any burning of the gasified fuel, whether

as a starting fuel or otherwise, involves continuous burning of the fuel for at least some finite period of time.” (Office Action, page 3). However, Applicants do not recite continuously burning the fuel for any finite period of time. Rather, amended claims 1 and 9 recite that the fuel gas is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned. Amended claims 1 and 9 are directed to substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the concentrated liquor is burned, not merely using the fuel as a starting fuel. By burning the fuel gas substantially continuously during the time in which the concentrated liquor is burned, the present invention eliminates the need for a separate bark boiler, while still meeting the energy requirements of the pulp mill. In clear contrast with the object of amended claims 1 and 9, Kuusio teaches burning the waste liquor gas in a superheated boiler or a separate bark boiler. (Kuusio, page 13, lines 24-26).

Rundstrom does not overcome the deficiencies of Saviharju and Kuusio, at least in that Rundstrom also does not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. In fact, Rundstrom does not appear to teach anything concerning the fuel supplied to a soda recovery boiler and, thus, does not disclose, teach or suggest anything about the feeding of a gasified bark fuel into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler.

Shaw does not overcome the deficiencies of Saviharju, Kuusio and Rundstrom, in that Shaw also does not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. First, Shaw does not appear to teach or suggest anything with regard to the use of gasified bark as a fuel gas. Instead, Shaw teaches the use of an auxiliary gas such as fuel oil. (Shaw, col. 3, lines 46-48). Second, Shaw does not teach that its auxiliary fuel is fed, at least in part, into the soda recovery boiler

substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead, Shaw teaches that, "...under normal conditions, black liquor is the only fuel supplied to the boiler 10." (Shaw, col. 3, lines 42-43). Shaw does teach that its auxiliary fuel may be used during startup, wherein the supply is turned off after initiating combustion of the black liquor, and in the event that the demand for steam exceeds that which can be supplied by the available black liquor. (Shaw, col. 3, lines 43-50; col. 3, lines 54-56). As discussed above, amended claims 1 and 9 are directed to eliminating the need for a separate bark boiler, while still meeting the energy requirements of the pulp mill, by providing substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the concentrated liquor is burned. Ignoring the fact that Shaw's auxiliary fuel does not teach anything about gasified wood bark, Shaw's supplying of auxiliary fuel during startup or in the event that the demand for steam exceeds that which can be supplied by burning the available black liquor does not teach or suggest that the fuel gas is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned. Thus, Shaw does not overcome the deficiencies of Saviharju, Kuusio and Rundstrom with regard to the recitations of amended claims 1 and 9.

Tomlinson II does not overcome the deficiencies of Saviharju, Kuusio, Rundstrom and Shaw, in that Tomlinson II also does not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. First, Tomlinson II does not teach or suggest using a gasified bark fuel because, according to Tomlinson II, gas does not distribute itself throughout the bed of the boiler. (Tomlinson II, col. 5-6, lines 67-2). Tomlinson II, instead, teaches the use of a particulate auxiliary solid fuel. (Tomlinson II, abstract). Applicants agree with the Examiner that Tomlinson II teaches that ligno-cellulosic fuel is particularly suitable as an auxiliary fuel. (Office Action, page 3). However, the ligno-cellulosic fuel taught by Tomlinson II to be particularly suitable is a "particulate solid fuel such as sawdust." (Tomlinson II, col. 5, lines 38-44, emphasis added). Thus, the only wood waste that

Tomlinson II discusses as being suitable for fuel is solid wood waste. Accordingly, Tomlinson II certainly does not teach using a gasified bark as fuel, and if anything, teaches away it. Second, Tomlinson II also does not teach or suggest that its fuel is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead, Tomlinson II teaches that, "...it is possible to maintain satisfactory operating temperatures throughout the furnace over a considerable range of production rates by adjusting the air supply to correspond to the rate of residual liquor production, if necessary adding oil or gas as an auxiliary fuel." (Tomlinson II, col. 6, lines 11-16). The Examiner asserts that Tomlinson II, thus, teaches that "a fuel gas is supplied and burned continuously during the period of fuel gas usage and during boiler operation." (Office Action, page 14). However, as discussed above, Applicants do not merely recite burning of the fuel for any finite period of time. Rather, amended claims 1 and 9 recite that the fuel gas is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned. Therefore, unlike the present invention's use of fuel during substantially the entire time the boiler is operating, Tomlinson II teaches that its auxiliary fuel is used only when the temperature cannot be regulated with the air supply alone. Thus, Tomlinson II does not overcome the deficiencies of Saviharju, Kuusio, Rundstrom and Shaw with regard to the recitations of amended claims 1 and 9.

Accordingly, the combination of Saviharju, Kuusio, Rundstrom, Shaw and Tomlinson II does not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead, the references fail to teach anything about the use of gasified bark as fuel in a soda recovery boiler. In fact, the only discussion in the cited references using any form of wood waste as fuel in a recovery boiler uses a "solid ligno-cellulosic fuel". (Tomlinson II, line 43). Furthermore, ignoring the fact that the references fail to teach gasified bark as fuel for the recovery boiler, the only auxiliary fuel use taught by the references is during startup or under

conditions where appropriate boiler temperatures cannot be maintained with normal regulatory measures. Thus, even where the cited references discuss auxiliary fuel for recovery boilers, they do not teach that the auxiliary fuel is fed into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler.

Accordingly, Applicants respectfully submit that neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II, nor any combination thereof, teaches or suggests each and every recitation of Applicants' amended claims 1 and 9.

Claims 2-4, 13, 14, 17, 18, 32-36, 38-40 and 42 depend, directly or indirectly, from amended claims 1 and 9 and include additional recitations thereto. Accordingly, Applicants respectfully submit that the rejection of claims 2-4, 13, 14, 17, 18, 32-36, 38-40 and 42 as unpatentable over Saviharju in view of Kuusio and Rundstrom as evidenced by Shaw and Tomlinson II is improper for at least the reasons stated in connection with amended claims 1 and 9.

Therefore, Applicants respectfully request that the rejection of claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 under 35 U.S.C. § 103(a) be withdrawn and claims 1-4, 9, 13, 14, 17, 18, 32-36, 38-40 and 42 be passed to issue.

Claims 6-8, 14-15, 19-31 and 41 were rejected under 35 U.S.C § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of O'Hagan.

Claims 6-8, 14-15, 28-31 and 41 depend, directly or indirectly, from Applicants' amended claims 1 and 9 and include additional recitations thereto. As stated in connection with amended claims 1 and 9, neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II, nor any combination thereof, teaches or suggests each and every recitation of amended claims 1 and 9.

Applicants respectfully submit that O'Hagan does not remedy the deficiencies of Saviharju, Kuusio, Rundstrom, Shaw and Tomlinson II as applied to amended claims 1 and 9, at least in that O'Hagan also does not teach or suggest that at least part of the dried bark is gasified to produce the

fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead, O'Hagan is concerned solely with the drying of wet wood waste (O'Hagan, col. 1, lines 6-7) and does not teach anything about gasifying dried bark to produce fuel gas or using gasified bark as fuel in a soda recovery boiler. Therefore, the combination of Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II and O'Hagan does not teach or suggest each and every recitation of Applicants' amended claims 1 and 9.

Accordingly, Applicants respectfully submit that the rejection of dependent claims 6-8, 14-15, 28-31 and 41 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of O'Hagan, is improper for at least this reason, and should be withdrawn.

Applicants' amended claim 19 recites an apparatus for producing, from wood bark, a biogenic fuel gas to be fed into a recovery boiler of a pulp mill, the apparatus being connected to a feed unit of the recovery boiler, wherein the apparatus comprises as a combination a bark-drying unit having feed means for the wood bark to be dried and outlet means for the dried bark, the bark-drying unit being adapted to utilize waste heat of the pulp mill for drying, and a dried-bark gasifier for producing fuel gas from the dried bark, the dried-bark gasifier having feed means for bark and outlet means for fuel gas, the feed means of the gasifier being connected to the outlet means of the drying unit and the outlet means of the gasifier being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler.

Neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II nor O'Hagan, nor any combination thereof, teaches or suggests each and every recitation of amended claim 19. For instance, the references fail to teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the

recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler.

Instead, Saviharju teaches that “[d]ried wood fuel, such as bark, is supplied through a line 12 to the gasification stage 10,” and that “gas generated in the gasifier flow through a line 44 to the superheating boiler.” (Saviharju, paragraph [0021]). Thus, Saviharju teaches a gasifier that feeds gasified wood fuel to a superheating boiler, not to the soda recovery boiler. The apparatus of amended claim 19 eliminates the need for a separate bark boiler by connecting the outlet means of the dried-bark gasifier to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Saviharju, which fails to teach or suggest connecting its gasifier to the recovery boiler, does not eliminate the separate bark boiler.

Kuusio does not overcome the deficiencies of Saviharju, at least in that Kuusio also does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, Kuusio teaches only “that the same fuel which is combusted in the recovery boiler, e.g. black liquor, may be processed by gasifying to provide the fuel for the separate superheating boiler.” (Kuusio, page 6, lines 17-21). The gasification of waste *liquor* does not teach or suggest the dried-bark gasifier of Applicants’ amended claim 19.

Furthermore, while Kuusio does teach that the waste liquor gas can be used as a *starting* fuel in the waste liquor recovery boiler (Kuusio, p. 10, line 37 – p. 11, line 1; emphasis added), use of gasified waste liquor in a recovery boiler does not teach or suggest anything about an apparatus for supplying gasified bark to the recover boiler. Additionally, Kuusio’s use of the gasified waste liquor as a *starting* fuel does not teach or suggest a dried-bark gasifier having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas during operation of the boiler. As discussed above, the Examiner asserts that “any burning of the gasified fuel, whether as a starting fuel or otherwise, involves

continuous burning of the fuel for at least some finite period of time.” (Office Action, page 3). However, Applicants do not recite burning of the fuel for any finite period of time. Rather, amended claim 19 recites a dried-bark gasifier having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas during operation of the boiler. Amended claim 19 is directed to an apparatus for substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the boiler is in operation, not merely using the fuel as a *starting* fuel. By burning the fuel gas substantially continuously while the boiler is in operation, the present invention eliminates the need for a separate bark boiler, while still meeting the energy requirements of the pulp mill. In clear contrast with the object of amended claim 19, Kuusio teaches burning its waste liquor gas in a superheated boiler or a separate bark boiler. (Kuusio, page 13, lines 24-26).

Rundstrom does not overcome the deficiencies of Saviharju and Kuusio, at least in that Rundstrom also does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. In fact, Rundstrom does not appear to teach anything concerning an apparatus for supplying fuel to a soda recovery boiler and, thus, does not disclose, teach or suggest anything about a dried-bark gasifier having outlet means connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler.

Shaw does not overcome the deficiencies of Saviharju, Kuusio and Rundstrom, in that Shaw also does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, Shaw does not appear to teach or suggest anything with regard to an apparatus for supplying gasified

bark as a fuel gas to a recovery boiler. Rather, Shaw teaches the use of an auxiliary gas such as fuel oil. (Shaw, col. 3, lines 46-48). Since Shaw does not teach or suggest gasified bark fuel, it certainly does not teach or suggest an apparatus for producing and supplying gasified bark fuel to a soda recovery boiler. Furthermore, Shaw does not teach an apparatus having outlet means to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, Shaw teaches that, "...under normal conditions, black liquor is the only fuel supplied to the boiler 10." (Shaw, col. 3, lines 42-43). Shaw does teach that its auxiliary fuel may be used during startup, wherein the supply is turned off after initiating combustion of the black liquor, and in the event that the demand for steam exceeds that which can be supplied by the available black liquor. (Shaw, col. 3, lines 43-50; col. 3, lines 54-56). As discussed above, amended claim 19 is directed to eliminating the need for a separate bark boiler, while still meeting the energy requirements of the pulp mill, by providing substantially continuous or uninterrupted burning of the fuel gas during the *entire* time that the boiler is in operation. Ignoring the fact that Shaw's auxiliary fuel does not teach anything about gasified wood bark, Shaw's supplying of auxiliary fuel during startup or in the event that the demand for steam exceeds that which can be supplied by burning the available black liquor does not teach or suggest an apparatus for substantially continuously feeding into the boiler the fuel gas during operation of the boiler. Thus, Shaw does not overcome the deficiencies of Saviharju, Kuusio and Rundstrom with regard to the recitations of amended claim 19.

Tomlinson II does not overcome the deficiencies of Saviharju, Kuusio, Rundstrom and Shaw, in that Tomlinson II also does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Rather, Tomlinson II does not teach or suggest any apparatus for producing and supplying gasified bark fuel because, according to Tomlinson II, gas does not distribute itself throughout the bed of the boiler. (Tomlinson II, col. 5-6, lines 67-2).

Tomlinson II, instead, teaches the use of a particulate auxiliary solid fuel. (Tomlinson II, abstract). Applicants agree with the Examiner that Tomlinson II teaches that ligno-cellulosic fuel is particularly suitable as an auxiliary fuel. (Office Action, page 3). However, the ligno-cellulosic fuel taught by Tomlinson II to be particularly suitable is a “particulate solid fuel such as sawdust.” (Tomlinson II, col. 5, lines 38-44, emphasis added). Thus, the only wood waste that Tomlinson II discusses as being suitable for fuel is solid wood waste. Since Tomlinson II does not teach or suggest gasified bark fuel, it certainly does not teach or suggest an apparatus for producing and supplying gasified bark fuel to a soda recovery boiler. Additionally, Tomlinson II does not teach or suggest an apparatus having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas during operation of the boiler. Instead, Tomlinson II teaches that, “...it is possible to maintain satisfactory operating temperatures throughout the furnace over a considerable range of production rates by adjusting the air supply to correspond to the rate of residual liquor production, if necessary adding oil or gas as an auxiliary fuel.” (Tomlinson II, col. 6, lines 11-16). The Examiner asserts that Tomlinson II, thus, teaches that “a fuel gas is supplied and burned continuously during the period of fuel gas usage and during boiler operation.” (Office Action, page 14). However, as discussed above, Applicants do not merely recite burning of the fuel for any finite period of time. Rather, amended claim 19 recites outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas during operation of the boiler. Therefore, unlike the present invention’s use of fuel during substantially the entire time the boiler is operating, Tomlinson II teaches that its auxiliary fuel is used only when the temperature cannot be regulated with the air supply alone. Thus, Tomlinson II does not overcome the deficiencies of Saviharju, Kuusio, Rundstrom and Shaw with regard to the recitations of amended claims 1 and 9.

O’Hagan does not overcome the deficiencies of Saviharju, Kuusio, Rundstrom, Shaw and Tomlinson II, at least in that O’Hagan also does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried

bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, O'Hagan is concerned solely with the drying of wet wood waste (O'Hagan, col. 1, lines 6-7) and fails to teach anything about a dried-bark gasifier for producing fuel gas from the dried bark having outlet means connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler.

Accordingly, the combination of Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II and O'Hagan does not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, the references fail to teach anything about a dried-bark gasifier having outlet means connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. In fact, the only discussion in the cited references supplying any form of wood waste as fuel in a recovery boiler uses a "solid ligno-cellulosic fuel". (Tomlinson II, line 43). Furthermore, the only auxiliary fuel taught by the references to be supplied to the recovery boiler is during startup or under conditions where appropriate boiler temperatures cannot be maintained with normal regulatory measures. Thus, even where the cited references discuss auxiliary fuel, they do not teach a dried-bark gasifier having outlet means to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler.

Accordingly, Applicants respectfully submit that neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II nor O'Hagan, nor any combination thereof, teaches or suggests each and every recitation of Applicants' amended claim 19.

Claims 20-27 depend, directly or indirectly, from amended claim 19 and include additional recitations thereto. Therefore, Applicants respectfully

submit that the rejection of claims 20-27 as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of O'Hagan is improper for at least the reasons stated in connection with amended claim 19.

Therefore, Applicants respectfully request that the rejection of claims 6-8, 14-15, 19-31 and 41 under 35 U.S.C. § 103(a) be withdrawn and claims 6-8, 14-15, 19-31 and 41 be passed to issue.

Claims 16 and 37 were rejected under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of Labedev-Krassin or Watchman. Claims 16 and 37 depend directly from Applicants' amended claims 1 and 9 and include additional recitations thereto. As stated in connection with amended claims 1 and 9, neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II, nor any combination thereof, teaches or suggests each and every recitation of amended claims 1 and 9.

Applicants respectfully submit that neither Labedev-Krassin nor Watchman overcome the deficiencies of Saviharju, Kuusio, Rundstrom, Shaw and Tomlinson II as applied to amended claims 1 and 9 at least in that Labedev-Krassin and Watchman also do not teach or suggest that at least part of the dried bark is gasified to produce the fuel gas that is fed, at least in part, into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Instead, Labedev-Krassin is concerned with a dryer and Watchman with a towel warmer. Neither Labedev-Krassin's dryer nor Watchman's towel warmer add anything to the discussion of feeding gasified bark fuel into the soda recovery boiler substantially continuously during the time in which the concentrated liquor is burned in the soda recovery boiler. Therefore, the combination of Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II, Labedev-Krassin and Watchman does not teach or suggest each and every recitation of Applicants' amended claims 1 and 9.

Accordingly, Applicants respectfully submit that the rejection of dependent claims 16 and 37 under 35 U.S.C. § 103(a) as unpatentable over

Saviharju in view of Kuusio and Rundstrom and further in view of Shaw and Tomlinson II and even further in view of Labedev-Krassin or Watchman is improper for at least this reason and should be withdrawn.

Claim 43 was rejected under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw, Tomlinson II and O'Hagan and even further in view of Labedev-Krassin or Watchman. Claim 43 depends directly from Applicants' amended claim 19 and includes additional recitations thereto.

As stated in connection with amended claim 19, neither Saviharju nor Kuusio nor Rundstrom nor Shaw nor Tomlinson II nor O'Hagan, nor any combination thereof, teaches or suggests each and every recitation of amended claim 19.

Applicants respectfully submit that neither Labedev-Krassin nor Watchman overcome the deficiencies of Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II and O'Hagan as applied to amended claim 19 at least in that Labedev-Krassin and Watchman also do not teach or suggest a dried-bark gasifier for producing fuel gas from the dried bark having outlet means for fuel gas being connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Instead, as stated above, Labedev-Krassin is concerned with a dryer and Watchman with a towel warmer. Neither Labedev-Krassin's dryer nor Watchman's towel warmer add anything to the discussion of a dried-bark gasifier having outlet means connected to the feed unit of the recovery boiler to substantially continuously feed into the boiler the fuel gas produced from the dried bark by gasification during operation of the boiler. Therefore, the combination of Saviharju, Kuusio, Rundstrom, Shaw, Tomlinson II, O'Hagan, Labedev-Krassin and Watchman does not teach or suggest each and every recitation of Applicants' amended claim 19.

Accordingly, Applicants respectfully submit that the rejection of dependent claim 43 under 35 U.S.C. § 103(a) as unpatentable over Saviharju in view of Kuusio and Rundstrom and further in view of Shaw, Tomlinson II

and O'Hagan and even further in view of Labedev-Krassin or Watchman is improper for at least this reason and should be withdrawn.

Having traversed each and every claim rejection, Applicants respectfully request that the rejections of claims 1-4, 6-9 and 13-43 be withdrawn, and claims 1-4, 6-9 and 13-43 be passed to issue.

Applicants respectfully submit that nothing in the current amendment constitutes new matter.

Applicants hereby petition for a two-month extension of time in which to file this amendment and response and authorize the charge of \$490.00, to cover the fee for the two-month extension of time, to be charged to our Deposit Account No. 13-0235.

Applicants believe that no additional fees are due in connection with this amendment and response. If any additional fees are deemed necessary, please charge them to deposit account 13-0235.

Respectfully submitted,

By /Marina F. Cunningham/
Marina F. Cunningham
Registration No. 38,419
Attorney for Applicant(s)

McCormick, Paulding & Huber LLP
CityPlace II, 185 Asylum Street
Hartford, CT 06103-4102
Tel: (860) 549-5290
Fax: (860) 527-0464